

| PO No   | Supplier  | Line No | Item No | Rel | Terms    | Purchased Item      | Description  | For Part | Project | Equipment ID | Order Qty | Due Date   | Received Quantity | Accounting Job No | Serial No | Status | Receive Date | Price/Unit    | Aging Days |
|---------|-----------|---------|---------|-----|----------|---------------------|--|----------|---------|--------------|-----------|------------|-------------------|-------------------|-----------|--------|--------------|---------------|------------|
| P038640 | TWM001-VU | 1       |         |     | 1 Net 30 | M6061T6T0.3125W.058 | Aluminum Tube .3125 X .058W : MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING AS PER WW-T-700/8 OR QQ-A-200/8 OR QQ-A-225/8 OR AMS 4080 OR AMS 4083 OR ASTM B210 OR ASTM B241 receive ft     |          |         |              | 240       | 12/21/2017 | 240               |                   | S025047   | Stock  | 12/19/2017   | \$ 2.50 / pcs | 0          |
|         |           | 2       |         |     |          | M6061T6T0.375W.035  | 6061-T6 Round Tube .375 X .035W : MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING AS PER WW-T-700/8 OR QQ-A-200/8 OR QQ-A-225/8 OR AMS 4080 OR AMS 4083 OR ASTM B210 OR ASTM B241 receive ft |          |         |              | 48        |            | 48                |                   | S024959   | Stock  | 12/19/2017   | \$ 3.40 / ft  | 0          |
|         |           | 3       |         |     |          | M6061T6T0.375W.058  | 6061-T6 Round Tube .375 X .058W : MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING AS PER WW-T-700/8 OR QQ-A-200/8 OR QQ-A-225/8 OR AMS 4080 OR AMS 4083 OR ASTM B210 OR ASTM B241 receive ft |          |         |              | 240       |            | 228               |                   | S024960   | Stock  | 12/19/2017   | \$ 2.15 / pcs | 0          |
|         |           | 4       |         |     |          | M6061T6T0.500W.049  | 6061-T6 Round Tube .500 X .049W : MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING AS PER WW-T-700/8 OR QQ-A-200/8 OR QQ-A-225/8 OR AMS 4080 OR AMS 4083 OR ASTM B210 OR ASTM B241 receive ft |          |         |              | 48        |            | 48                |                   | S024961   | Stock  | 12/19/2017   | \$ 2.91 / ft  | 0          |
|         |           | 5       |         |     |          | M4130NT0.500W.083   | 4130 Round Tube .500 X .083W : MATERIAL: AISI 4130N STEEL TUBING AS PER MLL-T-6736 OR AMS 6371/6360/6361/6362 6373/6374 receive ft   |          |         |              | 60        |            | 60                |                   | S024962   | Stock  | 12/19/2017   | \$ 4.00 / ft  | 0          |
| Total:  |           |         |         |     |          |                     |  |          |         |              |           |            | 636               |                   |           |        |              |               |            |
|         |           |         |         |     |          |                     |  |          |         |              |           |            | 624               |                   |           |        |              |               |            |

Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada



Tel (613) 632-5200

# PURCHASE ORDER

PO038640

## Supplier:

TWM001-VU  
TW Metals  
PO Box 933014  
Atlanta, GA 31193-3014 USA  
Phone: 585 768 5600  
Fax: 585 768 5601

## Ship To:

1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

## Via:

Ground  
Net 30

## Ship-To Contact:

Lavoie, Chantal  
clavoie@dartaero.com

## Revision Date:

PO No: PO038640  
PO Date: 12/13/17  
Due Date: 12/21/17

## Purchase Order

## Revision:

## Due Date:

## Status:

## Order

## Quantity

## Received

## Balance

## Unit

## Price (USD)

## Extended

## Price

## Items

| Line | Item                | Part                        | Description  | Status | Due Date | Order Quantity | Received Quantity | Balance | Unit | Price (USD) | Extended Price |
|------|---------------------|-----------------------------|--|--------|----------|----------------|-------------------|---------|------|-------------|----------------|
| 1    | M6061T6T0.3125W.058 | Aluminum Tube .3125 X .058W | T6/T62/T6510/T6511 SEAMLESS<br>TUBING AS PER WW-T-700/8<br>OR QQ-A-200/8 OR AMS 4080<br>OR AMS 4083 OR ASTM B210<br>OR ASTM B241<br>receive ft | Firmed | 12/21/17 | 240 pcs        | 0 pcs             | 240 pcs |      | \$2.50/pcs  | \$600.00       |
| 2    | M6061T6T0.375W.035  | 6061-T6 Round Tube .375     | T6/T62/T6510/T6511 SEAMLESS<br>TUBING AS PER WW-T-700/8<br>OR QQ-A-200/8 OR AMS 4080<br>OR AMS 4083 OR ASTM B210<br>OR ASTM B241<br>receive ft | Firmed | 12/21/17 | 48 ft          | 0 ft              | 48 ft   |      | \$3.40/ft   | \$163.20       |
| 3    | M6061T6T0.375W.058  | 6061-T6 Round Tube .375     | T6/T62/T6510/T6511 SEAMLESS<br>TUBING AS PER WW-T-700/8<br>OR QQ-A-200/8 OR AMS 4080<br>OR AMS 4083 OR ASTM B210<br>OR ASTM B241<br>receive ft | Firmed | 12/21/17 | 240 pcs        | 0 pcs             | 240 pcs |      | \$2.15/pcs  | \$516.00       |
| 4    | M6061T6T0.500W.049  | 6061-T6 Round Tube .500     | T6/T62/T6510/T6511 SEAMLESS<br>TUBING AS PER WW-T-700/8<br>OR QQ-A-200/8 OR AMS 4080<br>OR AMS 4083 OR ASTM B210<br>OR ASTM B241<br>receive ft | Firmed | 12/21/17 | 48 ft          | 0 ft              | 48 ft   |      | \$2.91/ft   | \$139.68       |

| Items   |                   |   |        |          |                |                   |         |                  |                |
|---|-------------------|---|--------|----------|----------------|-------------------|---------|------------------|----------------|
| Line Item   | Part              | Description   | Status | Due Date | Order Quantity | Received Quantity | Balance | Unit Price (USD) | Extended Price |
| 5   | M4130NT0.500W.083 | 4130 Round Tube .500 X .083W<br>: MATERIAL: AISI 4130N STEEL<br>TUBING AS PER MIL-T-6736 OR<br>AMS 6371/6360/6361/6362<br>6373/6374<br>receive ft | Firmed | 12/21/17 | 60 ft          | 0 ft              | 60 ft   | \$4.00/ft        | \$240.00       |
| Grand Total: \$1,658.88   |                   |   |        |          |                |                   |         |                  |                |
| Order Notes   |                   |   |        |          |                |                   |         |                  |                |
| Procurement Quality Clauses<br>A005 right of entry<br>A012 chemical and physical test report<br>A016 personnel qualification<br>A017 raw material identification (as applicable)<br>A026 certification of material conformance<br>A041 quality management system<br>A042 dart notification by supplier<br>A043 retention of quality documents<br>A048 counterfeit parts avoidance, detection, mitigation and disposition program<br>A049 supplier awareness<br><br>Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit <a href="http://www.dartaerospace.com">www.dartaerospace.com</a> for further explanation. |                   |   |        |          |                |                   |         |                  |                |

Plex 12/13/17 2:22 PM dart.lavoie.chantal



O'Neal High-Performance Metals Group



Packing Slip

ORDER NO.: 60645909

FROM: CRAN

PAGE 1

CUST NUMBER: 1203820 NET WGT: 57.669 REQ.DATE: 12/21/17 CONFIRMED  
SOLD TO: SHIP TO:  
DART AEROSPACE LTD DART AEROSPACE LTD  
1270 ABERDEEN ST 1270 ABERDEEN ST  
HAWKESBURY ON HAWKESBURY ON  
CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 12/14/17  
TERMS: NET 30 DAYS VIA: COMMON CARRIER  
F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
CUST ORD NO.: PO038640 RELEASE NO.:  
RECEIVING PHONE:

| LINE | ITEM  | DESCRIPTION                | WIDTH | LENGTH   |
|------|-------|----------------------------|-------|----------|
| 0001 | 41723 | D6061-T6 5/16 OD X .058 WA |       | 12 FT ML |

| CLN# | ORD QTY    | INVOICE QTY | SHIPPED QTY | WT     |
|------|------------|-------------|-------------|--------|
|      | 240.000 FT | 240.000 FT  | 240.000 FT  | 13.104 |

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/00  
PO:49379694 HT:2806820 PC: 20 CUSTOMER QTY: 240.000 UOM  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:474075

| CLN# | ORD QTY | INVOICE QTY               | SHIPPED QTY | WT       |
|------|---------|---------------------------|-------------|----------|
| 0002 | 41879   | D6061-T6 3/8 OD X .035 WA |             | 12 FT ML |

| CLN# | ORD QTY   | INVOICE QTY | SHIPPED QTY | WT    |
|------|-----------|-------------|-------------|-------|
|      | 48.000 FT | 48.000 FT   | 48.000 FT   | 2.108 |

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/00  
PO:49364047 HT:F002343910001 PC: 1 CUSTOMER QTY: 12.000 UOM  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:222468  
PO:49378065 HT:F002527800001 PC: 3 CUSTOMER QTY: 48.000 UOM  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:224433

| CLN# | ORD QTY | INVOICE QTY               | SHIPPED QTY | WT       |
|------|---------|---------------------------|-------------|----------|
| 0003 | 41952   | D6061-T6 3/8 OD X .058 WA |             | 12 FT ML |

| CLN# | ORD QTY    | INVOICE QTY | SHIPPED QTY | WT     |
|------|------------|-------------|-------------|--------|
|      | 240.000 FT | 240.000 FT  | 240.000 FT  | 16.272 |

\*\* 1 TEST REPORTS REQUIRED \*\*

\*\* 1 CERTS REQUIRED \*\*

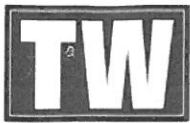
ECCN: EAR99 Export License: NLR Expiration Date: 0/00/00  
PO:49376296 HT:F002504860001 PC: 20 CUSTOMER QTY: 240.000 UOM FT  
MLT:UNITED STATES MFG:UNITED STATES SLB/CL:224194

228 Good

THANK YOU FOR THIS ORDER

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE  
PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL  
REVIEW.  
<http://www.twmetals.com/invoice-terms.html>





O'Neal High-Performance Metals Group



**Packing Slip**

ORDER NO.: 60645909 FROM: CRAN PAGE 2

CUST NUMBER: 1203820 NET WGT: 57.669 REQ.DATE: 12/21/17 CONFIRMED  
 SOLD TO: SHIP TO:  
 DART AEROSPACE LTD DART AEROSPACE LTD  
 1270 ABERDEEN ST 1270 ABERDEEN ST  
 HAWKESBURY ON HAWKESBURY ON  
 CANADA CN K6A 1K7 ONTARIO CANADA CN K6A 1K7

SALESPERSON: DONNA SMALLEY SHIP BY: 12/14/17  
 TERMS: NET 30 DAYS VIA: COMMON CARRIER  
 F.O.B.: SHIPPING POINT FREIGHT: PREPAID  
 CUST ORD NO.: PO038640 RELEASE NO.:  
 RECEIVING PHONE:

LINE ITEM DESCRIPTION WIDTH LENGTH

0004 42252 D6061-T6 1/2 OD X .049 WA 12 FT ML

| CLN# | ORD QTY   | INVOICE QTY | SHIPPED QTY | WT    |
|------|-----------|-------------|-------------|-------|
|      | 48.000 FT | 48.000 FT   | 48.000 FT   | 3.917 |

\*\* 1 TEST REPORTS REQUIRED \*\*  
 \*\* 1 CERTS REQUIRED \*\*

ECCN: EAR99 Export License: NLR Expiration Date: 0/  
 PO:49377015 HT:F002524800001 PC: 4 CUSTOMER QTY: 48.000  
 MLT:UNITED STATES MFG:UNITED STATES SLB/CL:224304

0005 32821 SMLSCD 4130 6736 1/2 X .083 WA 17/24 FT

| CLN# | ORD QTY   | INVOICE QTY | SHIPPED QTY | WT     |
|------|-----------|-------------|-------------|--------|
|      | 60.000 FT | 60.250 FT   | 60.250 FT   | 22.268 |

\*\* 1 TEST REPORTS REQUIRED \*\*  
 \*\* 1 CERTS REQUIRED \*\*

ECCN: 9A991.d Export License: NLR Expiration Date: 0/  
 PO:49362520 HT:253636 PC: 3 CUSTOMER QTY: 60.250  
 MLT:GERMANY MFG:GERMANY SLB/CL:1632158

BROKERS KUEHNE AND NAGEL LTD

| AREA |  | TYPE OF PKG | PKGS  | GRS WEIGHT | WIDTH | LENGTH  |
|------|--|-------------|-------|------------|-------|---------|
| B    |  | CARTON      | 1.000 | 77.000     |       | 20.5000 |
| B    |  | CARTON      | 1.000 |            |       | 12.5000 |

**THANK YOU FOR THIS ORDER**

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE  
 PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL  
 REVIEW.  
<http://www.twmetals.com/invoice-terms.html>



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Packing Slip

ORDER NO.: 60645909 FROM: CRAN PAGE 3

CUST NUMBER: 1203820 NET WGT: 57.669 REQ. DATE: 12/21/17 CONFIRMED

SOLD TO: DART AEROSPACE LTD 1270 ABERDEEN ST HAWKESBURY ON CANADA  
SHIP TO: DART AEROSPACE LTD 1270 ABERDEEN ST HAWKESBURY ON ONTARIO CANADA  
SHIP BY: 12/14/17 COMMON CARRIER PREPAID

SALESPERSON: DONNA SMALLEY NET 30 DAYS SHIPPING POINT F.O.B.:  
CUST ORD NO.: P0038640  
RECEIVING PHONE: RELEASE NO.:  
FREIGHT: VIA:  
UNLOAD TYPE: NONE SPECIFIED

2.000 77.000

BY: CI RT 000-

DATE SHIPPED

DATE FILLED

THANK YOU FOR THIS ORDER

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL REVIEW.  
<http://www.twmetals.com/invoice-terms.html>



O'Neal High-Performance Metals Group



Packing Slip

ORDER NO.: 60645909 FROM: CRAN PAGE 4

CUST NUMBER: 1203820 NET WGT: 57.669 REQ. DATE: 12/21/17 CONFIRMED

SOLD TO: SHIP TO:

DART AEROSPACE LTD  
1270 ABERDEEN ST  
HAWKESBURY ON

CANADA CN K6A 1K7

DART AEROSPACE LTD  
1270 ABERDEEN ST  
HAWKESBURY ON  
ONTARIO CANADA CN K6A 1K7

SHIP BY: 12/14/17

27 ENGLEHARD DRIVE  
MONROE TWP NJ 08831

TERMS: NET 30 DAYS  
F.O.B.: SHIPPING POINT  
CUST ORD NO.: P0038640

VIA: COMMON CARRIER  
FREIGHT: PREPAID

RELEASE NO.:  
RECEIVING PHONE:

"TW Metals MSDS data is available on our web site at [www.twmetals.com](http://www.twmetals.com). MSDS & Data can be found under the Technical Resources Tab, Product Statistics you may telephone 610-458-1300 and we will mail or fax a copy of our current MSDS data to your location."

# "CERTIFICATE OF CONFORMANCE"

"TW Metals certifies that the material supplied on this purchase order and contained in the heat/lot number referenced above has been manufactured, inspected, and tested in accordance with the material specification. These records are on file at TW Metals. Packaging material for shipments to Europe and China consists of manufactured wood products and complies with the European emergency measures for confireous non-manufactured wood packing material"

Electronically Generated Certificate-Valid without signature Date: 12/14/17  
These commodities have been exported from the United States in accordance with the U.S. export control laws, export administrations regulations. Diversion contrary to U.S. law prohibited.

THANK YOU FOR THIS ORDER

TERMS AND CONDITIONS APPLICABLE TO THE SALE OF THESE  
PRODUCTS ARE SET FORTH ON OUR WEBSITE FOR YOUR CAREFUL  
REVIEW.  
<http://www.twmetals.com/invoice-terms.html>

By:

James O'Connell

We hereby certify that the material has been manufactured and tested in accordance with the requirements of the applicable specifications and descriptions set forth on Precision Tube's sales acknowledgment. During the manufacturing, testing and inspection, the product did not come into direct contact with mercury or any of its compounds, nor with any mercury containing device employing a single boundary containment. Test results indicate that the material is compliant with the current revision of the RoHS Directive (2011/65/EU).

|   |   |   |  |
|---|---|---|--|
| CUSTOMER PURCHASE ORDER NO.   | M 49379694 LINE 001   | CUST. ORD. NO.  | 4747075                                |
| <b>SOLD:</b> TW METALS<br>175 TUBEWAY<br>FOREST PARK, GA 30298<br>UNITED STATES |   | <b>SHIP:</b> TW METALS<br>175 TUBEWAY<br>FOREST PARK, GA 30298<br>UNITED STATES |  |
| QUANTITY ORD.   | DESCRIPTION   | QTY. SHIPPED  | DATE SHIPPED                           |
| 3000 FT   | METAL - 6061 ALUM<br>TEMPER - T6<br>SPEC - AMS 4082P<br>ASTM-B-210-12 AMS-MW-T-700/6C<br>LENGTH - 12 FT<br>LGTH TOP +.1250 IN -.0000 IN<br>SHAPE - ROUND<br>FINISH - STRAIGHT EXACT LENGTHS<br>OD .3125<br>ID .0580<br>WALL +.0040 -.0040 | 3300 FT   | 11/29/17                               |
| <b>MECHANICAL PROPERTIES</b>  |   |   |  |
| SAMPLE #  | TENSILE STRENGTH (P.S.I.)<br>46,159<br>47,629   | YIELD STRENGTH (P.S.I.)<br>41,594<br>43,126                                     | ELONGATION IN 2 INCHES (%)<br>14<br>17 |
| AVERAGE GRAIN SIZE (MM.)  | ROCKWELL HARDNESS   |   |  |
| <b>DESTRUCTIVE TESTS</b>  |   |   |  |
| Comments: FAR BAA COMPLIES, DEARS BAA COMPLIES, FAR TAA COMPLIES                |   |   |  |
| <b>NON-DESTRUCTIVE TESTS</b>  |   |   |  |
| EDDY CURRENT: PASS  |   |   |  |
| <b>CHEMICAL COMPOSITION</b>   |   |   |  |
| Alloy: 6061 HEAT: TRACABILITY #: 2806820  |   |   |  |
| RAW MATL VENDOR: PIC13725 - KAISER ALUMINUM INVESTMENTS                         |   |   |  |
| Si Fe Cu Mn Mg Cr Zn Ti Al Rem.   |   |   |  |
| 0.40 0.15 0.80 0.04 0.35 0.25 0.15  |   |   |  |
| OTHER ELEMENTS: 0.05 MAX EACH / 0.15 MAX TOTAL                                  |   |   |  |

**CERTIFIED TEST REPORT**

Control No: 6106

PRECISION TUBE CO.

287 WISSAHICKON AVE.  
NORTH WALES PA 19454

**A COMPANY OF MUELLER INDUSTRIES**



# KAISER ALUMINUM FABRICATED PRODUCTS

CERTIFIED TEST REPORT  
http://Online.KaiserAluminum.com

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

|                                 |            |                             |             |   |        |
|---------------------------------|------------|-----------------------------|-------------|---|--------|
| CUSTOMER PO NUMBER: M49364047-1 |            | CUSTOMER PART NUMBER: 41879 |             | PRODUCT DESCRIPTION: Drawn Seamless Tube/Pipe   |        |
| KAISER ORDER NUMBER: LINE ITEM: | 001        | SHIP DATE:                  | F00234391   | KAISER LOT NUMBER:  | 6061   |
| WEIGHT SHIPPED:                 | 188,000 LB | QUANTITY:                   | 355,000 PCS | B/L NUMBER:   | 224424 |
| SHIP TO:                        |            | SOLD TO:                    |             | TW METALS INC<br>27 ENGLEHARD DRIVE<br>EXIT 8A OFF NJ TPK<br>MONROE TWP, NJ 08831 USA |        |
|                                 |            |                             |             | TW METALS INC<br>760 CONSTITUTION DRIVE<br>SUITE 204<br>EXTON, PA 19341 USA           |        |

## Actual Physical Properties

|           |           |       |      |         |   |           |      |           |      |        |      |          |     |          |     |      |     |
|-----------|-----------|-------|------|---------|---|-----------|------|-----------|------|--------|------|----------|-----|----------|-----|------|-----|
| REFERENCE | F00234391 | DASH# | 0001 | SAMPLE# | 1 | UTS (KSI) | 47.7 | YTS (KSI) | 40.2 | ELONG% | 17.0 | HARDNESS | N/A | CON%IACS | N/A | BEND | N/A |
|-----------|-----------|-------|------|---------|---|-----------|------|-----------|------|--------|------|----------|-----|----------|-----|------|-----|

## Chemical Composition (Wt%), Aluminum Remainder

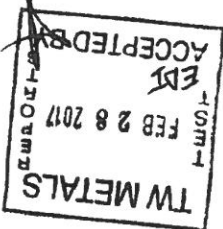
| LIMITS  | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Ti   | Pb  | Bi  | Zr  | Ea   | Tot  |
|---------|------|------|------|------|------|------|------|------|-----|-----|-----|------|------|
| Maximum | 0.80 | 0.70 | 0.40 | 0.15 | 1.20 | 0.35 | 0.25 | 0.15 | NA  | NA  | NA  | 0.05 | 0.15 |
| Minimum | 0.40 | 0.00 | 0.15 | 0.00 | 0.80 | 0.04 | 0.00 | 0.00 | NA  | NA  | NA  | 0.00 | 0.00 |
| D76511  | .59  | .28  | .23  | .06  | .98  | .08  | .07  | .02  | .00 | .00 | .00 | .01  | .02  |

## Applicable Requirements:

Description: OD: 0.3750"; Wall: 0.0350"; Round @  
AMS4082P AMS-WW-T-700/6C ASTM B210-12  
WE TAKE EXCEPTION TO PARA. 5.2.1., Per AMS4082P, WAS NOT OILED.  
This product complies to FAR BAA, DEARS BAA, FAR TAA  
COMPLIES TO DIN EN 10204 JAN 2005  
No Weld Repair. Mercury Free.

## Miscellaneous Notes

MANUFACTURED IN USA MELTED IN USA  
MATERIAL COMPLIES WITH FAR BAA (FAR 52.225-1, BUY AMERICAN ACT- SUPPLIES), DEARS BAA  
(DEARS 252.225-7001 BUY AMERICAN ACT & BAL OF PAYMENTS PROG), AND FAR TAA (FAR 52.225-5  
TRADE AGREEMENTS).



# **KAISER ALUMINUM FABRICATED PRODUCTS**

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

## **CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC ('Kaiser') hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms & conditions of sale. Test reports are on file subject to examination.

Hans Kattentidt, Quality Manager



**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

Plant Serial: 00024251  
Kaiser Order Number: 222468  
Line Item: 001

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6673 W. WILLIS ROAD  
CHANDLER, AZ 85226

|   |  |             |  |                       |  |                    |  |                      |  |                          |  |
|---|--|-------------|--|-----------------------|--|--------------------|--|----------------------|--|--------------------------|--|
| CUSTOMER PO NUMBER:   |  | M49378065-1 |  | CUSTOMER PART NUMBER: |  | 41879              |  | PRODUCT DESCRIPTION: |  | Drawn Seamless Tube/Pipe |  |
| KAISER ORDER NUMBER:  |  | LINE ITEM:  |  | SHIP DATE:            |  | KAISER LOT NUMBER: |  | ALLOY:               |  | TEMPER:                  |  |
| 224433  |  | 001         |  | 10/23/2017            |  | F00252780          |  | 6061                 |  | T6                       |  |
| WEIGHT SHIPPED:   |  | QUANTITY:   |  | B/L NUMBER:           |  | DIAM/DA/TF/THKNS:  |  | WIDTH:               |  | LENGTH:                  |  |
| 151,000 LB  |  | 285,000 PCS |  | 227219                |  |                    |  |                      |  | 12,000 FT                |  |
| SHIP TO:  |  |             |  |                       |  |                    |  |                      |  |                          |  |
| TW METALS INC<br>27 ENGLEHARD DRIVE<br>EXIT 8A OFF NJ TPK<br>MONROE TWP, NJ 08831 USA |  |             |  |                       |  |                    |  |                      |  |                          |  |
| SOLD TO:  |  |             |  |                       |  |                    |  |                      |  |                          |  |
| TW METALS INC<br>760 CONSTITUTION DRIVE<br>SUITE 204<br>EXTON, PA 19341 USA           |  |             |  |                       |  |                    |  |                      |  |                          |  |

## Actual Physical Properties

| REFERENCE | DASH# | SAMPLE# | UTS (KSI) | YTS (KSI) | ELONG% | HARDNESS | CONFIACS | BEND |
|-----------|-------|---------|-----------|-----------|--------|----------|----------|------|
| F00252780 | 0001  | 1       | 49.8      | 42.8      | 17.5   | N/A      | N/A      | N/A  |

## Chemical Composition (wt%), Aluminum Remainder

| LIMITS  | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Ti   | Pb  | Bi  | Zr  | Ea   | Tot  |
|---------|------|------|------|------|------|------|------|------|-----|-----|-----|------|------|
| Maximum | 0.80 | 0.70 | 0.40 | 0.15 | 1.20 | 0.35 | 0.25 | 0.15 | NA  | NA  | NA  | 0.05 | 0.15 |
| Minimum | 0.40 | 0.00 | 0.15 | 0.00 | 0.80 | 0.04 | 0.00 | 0.00 | NA  | NA  | NA  | 0.00 | 0.00 |
| D20573  | .59  | .26  | .22  | .04  | .97  | .09  | .04  | .03  | .00 | .00 | .00 | .00  | .00  |

## Applicable Requirements:

Description: 0.3750" Wall: 0.0350" Round @  
 AMS4082P AMS-WW-T-706/6C ASTM B210-12  
 WE TAKE EXCEPTION TO PARA. 5.2.1, Per AMS4082P, WAS NOT OILED.  
 This Product Complies to FAR BAA, DEARS BAA, FAR TAA  
 COMPLIES TO DIN EN 10204 JAN 2005  
 No Weld Repair. Mercury Free.

## Miscellaneous Notes

MANUFACTURED IN USA. MELTED IN USA  
 MATERIAL COMPLIES WITH FAR BAA (FAR 52.225-1, BUY AMERICAN ACT-SUPPLIES), DEARS BAA  
 (DEARS 252.225-7001 BUY AMERICAN ACT & BAL OF PAYMENTS PROG), AND FAR TAA (FAR 52.225-5  
 TRADE AGREEMENTS).





**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

**KAISER ALUMINUM**  
**FABRICATED PRODUCTS, LLC**  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC ('Kaiser') hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgment form. Any warranty is limited to that shown on Kaiser's general terms conditions of sale. Test reports are on file subject to examination.

Hans Kattentidt, Quality Manager

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

|   |  |                       |  |                          |  |
|---|--|-----------------------|--|--------------------------|--|
| CUSTOMER PO NUMBER:   |  | CUSTOMER PART NUMBER: |  | PRODUCT DESCRIPTION:     |  |
| M49376296-1   |  | 41952                 |  | Drawn Seamless Tube/Pipe |  |
| KAISER ORDER NUMBER:  |  | LINE ITEM:            |  | SHIP DATE:               |  |
| 224194  |  | 001                   |  | 09/23/2017               |  |
| WEIGHT SHIPPED:   |  | QUANTITY:             |  | BL NUMBER:               |  |
| 474.000 LB  |  | 585.000 PCS           |  | 226892                   |  |
| SHIP TO:  |  |                       |  |                          |  |
| TW-METALS INC<br>235 WEST TUBEWAY DRIVE<br>CAROL STREAM, IL 60188 USA       |  |                       |  |                          |  |
| SOLD TO:  |  |                       |  |                          |  |
| TW METALS INC<br>760 CONSTITUTION DRIVE<br>SUITE 204<br>EXTON, PA 19341 USA |  |                       |  |                          |  |
| KAISER LOT NUMBER:  |  | ALLOY:                |  | TEMPER:                  |  |
| F00250486   |  | 6061                  |  | T6                       |  |
| DIAW/DAF/THKNS:   |  | WIDTH:                |  | LENGTH:                  |  |
|   |  |                       |  | 12.000 FT                |  |

**Actual Physical Properties**

|           |       |         |           |           |        |          |          |      |
|-----------|-------|---------|-----------|-----------|--------|----------|----------|------|
| REFERENCE | DASH# | SAMPLE# | UTS (KSI) | YTS (KSI) | ELONG% | HARDNESS | CON&IACS | BEND |
| F00250486 | 0001  | 1       | 48.0      | 41.5      | 17.0   | N/A      | N/A      | N/A  |

**Chemical Composition (wt%), Aluminum Remainder**

| LIMITS  | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Pb   | Bi  | Zr  | Ea   | Tot  |
|---------|------|------|------|------|------|------|------|------|-----|-----|------|------|
| Maximum | 0.80 | 0.70 | 0.40 | 0.15 | 1.20 | 0.35 | 0.25 | 0.15 | NA  | NA  | 0.05 | 0.15 |
| Minimum | 0.40 | 0.00 | 0.15 | 0.00 | 0.80 | 0.04 | 0.00 | 0.00 | NA  | NA  | 0.00 | 0.00 |
| D20419  | .61  | .27  | .21  | .04  | .98  | .09  | .05  | .03  | .00 | .00 | .01  | .02  |

**Applicable Requirements:**

Description: OD: 0.3750"; Wall: 0.0580"; Round &  
AMS4082P AMS-WW-T-700/6C ASTM B210-12  
WE TAKE EXCEPTION TO PARA. 5.2.1., Per AMS4082P, WAS NOT OILED.  
This Product Complies to FAR BAA, DEARS BAA, FAR TAA  
COMPLIES TO DIN EN 10204 JAN 2005  
No Weld Repair. Mercury Free.



**Miscellaneous Notes**

MANUFACTURED IN USA MELTED IN USA  
MATERIAL COMPLIES WITH FAR BAA (FAR 52.225-1, BUY AMERICAN ACT-SUPPLIES), DEARS BAA  
(DEARS 252.225-7001 BUY AMERICAN ACT & BAL OF PAYMENTS PROG), AND FAR TAA (FAR 52.225-5  
TRADE AGREEMENTS).

AK

Plant Serial: 00026215  
Kaiser Order Number: 224194  
Line Item: 001

Page 2 of 2



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Kaiser Aluminum Fabricated Products, LLC ('Kaiser') hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms conditions of sale. Test reports are on file subject to examination.

Hans Kattenidt, Quality Manager

CERTIFICATION

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

**KAISER**  
**ALUMINUM**  
**FABRICATED PRODUCTS**

Handwritten signature/initials

CERTIFIED TEST REPORT  
<http://Online.KaiserAluminum.com>

KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

**CERTIFIED TEST REPORT**  
<http://Online.KaiserAluminum.com>

|   |  |   |  |                          |  |
|---|--|---|--|--------------------------|--|
| CUSTOMER PO NUMBER:   |  | CUSTOMER PART NUMBER:   |  | PRODUCT DESCRIPTION:     |  |
| M49377015-1   |  | 42252   |  | Drawn Seamless Tube/Pipe |  |
| KAISER ORDER NUMBER:  |  | SHIP DATE:  |  | KAISER LOT NUMBER:       |  |
| 224304  |  | 10/16/2017  |  | F00252480                |  |
| WEIGHT SHIPPED:   |  | QUANTITY:   |  | DIA/DAF/THKNS:           |  |
| 584.000 LB  |  | 598.000 PCS   |  | 227143                   |  |
| SHIP TO:  |  | SOLD TO:  |  |                          |  |
| TW METALS INC<br>235 WEST TUBEWAY DRIVE<br>CAROL STREAM, IL 60188 USA |  | TW METALS INC<br>760 CONSTITUTION DRIVE<br>SUITE 204<br>EXTON, PA 19341 USA |  |                          |  |

**Actual Physical Properties**

| REFERENCE | DASH# | SAMPLE# | UTS (KSI) | YTS (KSI) | ELONG% | HARDNESS | CONFIACS | BEND |
|-----------|-------|---------|-----------|-----------|--------|----------|----------|------|
| F00252480 | 0001  | 1       | 48.8      | 40.4      | 21.5   | N/A      | N/A      | N/A  |
| F00252480 | 0002  | 1       | 47.2      | 39.3      | 20.0   | N/A      | N/A      | N/A  |

**Chemical Composition (wt%), Aluminum Remainder**

| LIMITS  | Si   | Fe   | Cu   | Mn   | Mg   | Cr   | Zn   | Ti   | Pb  | Bi  | Zr  | Ea   | Tot  |
|---------|------|------|------|------|------|------|------|------|-----|-----|-----|------|------|
| Maximum | 0.80 | 0.70 | 0.40 | 0.15 | 1.20 | 0.35 | 0.25 | 0.15 | NA  | NA  | NA  | 0.05 | 0.15 |
| Minimum | 0.40 | 0.00 | 0.15 | 0.00 | 0.80 | 0.04 | 0.00 | 0.00 | NA  | NA  | NA  | 0.00 | 0.00 |
| D20571  | .57  | .26  | .21  | .04  | .97  | .09  | .04  | .03  | .00 | .00 | .00 | .01  | .02  |
| D20419  | .61  | .27  | .21  | .04  | .98  | .09  | .05  | .03  | .00 | .00 | .00 | .01  | .02  |

**Applicable Requirements:**

Description: OD: 0.5000", Wall: 0.0490", Round @  
AMS4082P AMS-WW-T-700/6C ASTM B210-12 WM-T-700/6F  
WE TAKE EXCEPTION TO PARA. 5.2.1., Per AMS4082P, WAS NOT OILED.  
This Product Complies to FAR BAA, DEARS BAA, FAR TAA  
COMPLIES TO DIN EN 10204 JAN 2005  
No Weld Repair. Mercury Free.



**Miscellaneous Notes**

MANUFACTURED IN USA MELTED IN USA  
MATERIAL COMPLIES WITH FAR BAA (FAR 52.225-1, BUY AMERICAN ACT-SUPPLIES), DEARS BAA  
(DEARS 252.225-7001 BUY AMERICAN ACT & BAT OF PAYMENTS PROG), AND FAR TAA (FAR 52.225-5  
TRADE AGREEMENTS).



KAISER ALUMINUM  
FABRICATED PRODUCTS, LLC  
6573 W. WILLIS ROAD  
CHANDLER, AZ 85226

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC ('Kaiser') hereby certifies that metal shipped under this order has been inspected and tested and found in conformance with the applicable specifications forming a part of the description set forth in Kaiser's sales acknowledgement form. Any warranty is limited to that shown on Kaiser's general terms & conditions of sale. Test reports are on file subject to examination.

Hans Kattenidt, Quality Manager



Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Padernborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1  
EN 10204:2005-01

Benteler SteelTube GmbH - Postfach 1340 - 33043 Padernborn - Deutschland

TW Metals  
The Aboretum, Suite 204  
760 Constitution Drive  
EXTON PA 19341  
USA

Dokument-Nr.: 41-991327/001/P

Document No.:  
No. du document:

Kunden-Bestell-Nr.: 46004784TW M49362520

Purchase Order No.:  
No. de commande du client:

Benteler Auftrags-Nr.: 1632158

Benteler Order No.:  
No. de commande Benteler:

Versandanzahlen-Nr.: 4185829

Dispatch Note No.:  
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE  
Product: SEAMLESS STEEL TUBES  
Produit: TUBES D'ACIER SANS SOUDURE

Lieferbedingungen: AMS-T-6736B-08 Type 1, ASTM-A 519-2006, MIL-T-6736B Type 1, AMS6360 Rev.M, AMS 2301K

Terms of delivery:

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Maße - Toleranzen: straightness acc. to customer request, AMS 2253E-83, Aircraft Type, Seamless, Cold Finished

Dimensions - tolérances:

Stahlsorte: GRADE 4130

Steel grade:

Nuance d'acier:

Lieferzustand: Condition N

Delivery condition:

État de livraison:

Produktkennzeichnung: FSD: BENTELER AMS6360M-AMS-T-6736 B 1-MIL-T-6736 B 1-AMS 2301K 4130 Condition N HEAT-NO.

Product marking: CD AO S DIMENSIONS WA GERMANY

Marquage du produit:

AZ = Ätzlinienbeschriftung, Etching ink marking, Gravure à l'acide . FK = Farbmarkierung, color marking, marquage par peinture . FS = Farbschablonierung, paint stencilling, marquage par peinture . FSD = Farbstrahlendruck, Color jet printer, imprimante à jet d'encre de couleur . LK = Laserkennzeichnung, Laser marking, Marquage laser . PKL = Etikettenkennzeichnung, tag marking, marquage sur étiquette . PS = Prägestempel, die stamp, marquage par poinçonnage . TS = Trichterstrahlkennzeichnung, ink jet spray marking, imprimante à jet d'encre .



**BENTELER**  
Steel/Tube

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Page:  
Page:



Hersteller: Warmrohrwerk/Zieherei  
Manufacturer: IDIN EN ISO 9001, ISO/TS-16949 CERTIFIED BY TÜV NORD CERTI  
Producteur: IPED 2014/68/EU CERTIFIED BY TÜV NORD SYSTEMSI

Herstellerzeichen:  
Manufacturer's brand:  
Marque du producteur:

Stempel des Abnahmebeauftragten: WA  
Stamp of the inspection representative:  
Poinçon du contrôleur:

Stahlschmelzungsverfahren: ELEKTROSTAHL  
Steelmaking process: ELECTRIC FURNACE  
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

45

Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**BENTELER**  
Steel/Tube

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 41-991327/001/P  
Document No.:  
No. du document:  
Prüf-Nr.:  
Inspection No.:  
No. du certificat:  
Blatt: 2 / 4  
Page:  
Page:

| Pos. Stück   | Maße                                     | Dimensions | Gesamtlänge     | Gewicht | Schmelzen-Nr. | Prüfdruck          | Rohr-Nr.-Gruppe        | Vielfachlängen      |
|--------------|--|------------|-----------------|---------|---------------|--------------------|------------------------|---------------------|
| Item Number  | Dimensions                               |            | Length total    | Weight  | Heat No.      | Test pressure      | Tube number group      | Multiple lengths    |
| Poste Nombre | Dimensions                               |            | Longueur totale | Poids   | No. de coulée | Pression d'épreuve | Série de no. des tubes | Longueurs multiples |
| 0008 125     | 0.500" O.D. * 0.083" WT<br>20 FT - 24 FT |            | 2500,56 feet    | 926 lbs | 253636        |                    |                        |                     |

**Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]**

| Pos. Schmelzen-Nr.  | C     | SI    | MN   | P     | S     | CR   | MO   | NI   | CU   |
|---------------------|-------|-------|------|-------|-------|------|------|------|------|
| Item Heat No.       |       |       |      |       |       |      |      |      |      |
| Poste No. de coulée |       |       |      |       |       |      |      |      |      |
| 0008 253636         | 0,320 | 0,270 | 0,57 | 0,008 | 0,001 | 0,88 | 0,17 | 0,09 | 0,14 |

**Produktanalyse [%] / Product analysis [%] / Analyse sur produit [%]**

| Pos. Schmelzen-Nr.  | C     | SI    | MN   | P     | S     | CR   | MO   | NI   | CU   |
|---------------------|-------|-------|------|-------|-------|------|------|------|------|
| Item Heat No.       |       |       |      |       |       |      |      |      |      |
| Poste No. de coulée |       |       |      |       |       |      |      |      |      |
| 0008 253636         | 0,310 | 0,280 | 0,55 | 0,012 | 0,002 | 0,88 | 0,17 | 0,09 | 0,15 |

**Prüfergebnisse / Test results / Résultats des essais**

**Die Rohre wurden zerstörungsfrei geprüft:**

The tubes are non destructive tested:

Les tubes ont passé un essai non destructif:

ET-Test: acc. to ASTM-A 450; ET - Test method: acc. to ASTM-E 309; for Imperfections; PASSED  
ET-Test: ET with rotating pancake coils; according to EN 10246-3; imperfections;  
Notch depth: 0,30 mm; notch width < = notch depth; notch length min. 2 x transducer width (max. 50 mm)

**Augensichtkontrolle:**

PASSED

Visual inspection:

Examen visuel:

Materialverwechslungsprüfung:

PASSED

Material conformity test:

Vérification de la nuance:

Maßkontrolle:

PASSED

Dimensions examination:

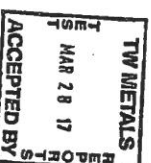
Vérification des dimensions:

**Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques**

**Die Probenahme erfolgte an Vielfachlängen.**

The sampling was carried out on multiple lengths.

L'échantillonnage était réalisé aux longueurs multiples.



16

15



Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.1366

**BENTELER**  
Steel/Tube

**ABNAHMEPRÜFZEUGNIS EN 10204-3.1**  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.:  
Document No.:  
No. du document:

41-991327/001/P

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Blatt: 3 / 4  
Page:  
Page:

Zugversuch längs bei RT, Vollprobe / Tensile test longitudinal at RT, Full section test specimen / Essai de traction longitudinale à TA, Eprovette a section complete

| Pos.                 | Proben-Nr.       | Schmelzen-Nr. | Probenabmessung         | Streckgrenze     | Zugfestigkeit            | Dehnung     |            |
|----------------------|------------------|---------------|-------------------------|------------------|--------------------------|-------------|------------|
| Item                 | Specimen No.     | Heat No.      | Specimen dimensions     | Yield strength   | Tensile strength         | Elongation  |            |
| Poste                | No. de l'éprouv. | No. de coulée | Dimensions de l'éprouv. | Limite élastique | Résistance à la traction | Allongement |            |
| <b>Anforderungen</b> |                  |               |                         |                  |                          |             |            |
| <b>Requirements</b>  |                  |               | mm                      | Rp 0,2 %         | Rm                       | A2"         | 1. Formel  |
| <b>Exigences</b>     |                  |               |                         | KSI              | KSI                      | %           | 1. Formula |
|                      |                  |               |                         | MIN 75           | MIN 95                   | MIN 12.00   | 1. Formule |
| 0008                 | 000001           | 253636        | 12,74 X                 | 2,13             | 103                      | 125         | 19,00      |
| 0008                 | 000002           | 253636        | 12,74 X                 | 2,13             | 101                      | 124         | 19,00      |
| 0008                 | 000003           | 253636        | 12,74 X                 | 2,13             | 101                      | 125         | 18,00      |

Randentkohlung / Surface decarburization / Décarburation superficielle

Pos. / Item / Poste: 0008  
acc. to AMS-6360, partial decarburization outside max. 0.014 in, partial decarburization inside max. 0.014 in, partial decarburization outside and inside max. 0.018 in, partial decarburization outside and inside max. 0.457 mm, without total decarburization; partial decarb. out. max.: 0,356 mm; partial decarb. ins. max.: 0,356 mm

Vermerk / Remark / Remarque

Pos. / Item / Poste: 0008

Certificate remarks: The steel grade corresponds to MIL-T-6736B, AMS 6360M, material free from mercury contamination, FAR BAA: 52.225-1 CANNOT COMPLY, DFARS BAA: 252.225-7001 CAN COMPLY, FAR TAA: 52.225-5 CAN COMPLY, No weld repair has been carried out, Country of origin of the material and heat: Germany, Aircraft quality steel acc. to AMS 2301K; see appendix page 1 of 1.

Pos. / Item / Poste: 0008

Macroscopic examination: acc. to ASTM-E 381

Pos. / Item / Poste: 0008

Magnetic particle Inspec.: acc. to AMS 2301K/ASTM-E 1444, on prematerial

Pos. / Item / Poste: 0008

Grain size: acc. to ASTM-E 112; Grain size and finer: 5; Grain size: Longitudinal structure micrography, On prematerial

Verkäufer(in) / Sales Personnel / Personne chargée : Mr. Schwarz, Tel.: 05254 81-204311, Fax: 204391



Handwritten mark/signature.

Benteler Steel/Tube GmbH  
Postfach 13 40  
33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13666

**BENTELER**   
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

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No. du document:

41-991327/001/P

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

Blatt: 4 / 4  
Page:  
Page:

Paderborn Schloß Neuhaus, 07.03.2017, TEL.: 05254.81-201768 FAX: 05254.81-201752

Abnahmebeauftragter  
Inspection representative

Contrôleur

I. A. THOMAS GOLLAN / Tat

Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtsgültig.  
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.  
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.





Benteler SteelTube GmbH  
Residenzstraße 1  
33104 Paderborn  
Germany  
Tel.: 49.5254.81-0 Fax: 49.5254.13866

**BENTELER**  
Steel/Tube

Abnahmeprüfzeugnis EN 10204-3.1 / Anhang  
Inspection Certificate EN 10204-3.1 / appendix  
Certificat de réception EN 10204-3.1 / appendice

Dokument-Nr.  
Document No.:  
No. de document:

41-991327/001/P

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Page: 1 of 1  
Page: de

Halbzeuguntersuchung: Stahlsorte 4130 / Semi finished product examination: grade 4130 / Produit semi-fini: nuance 4130

| Schmelzen-Nr.<br>Heat No.<br>Coulée No. | Position<br>Item<br>Poste | Korngröße<br>Grain size<br>Grosseur de grain<br>(ASTM-E 112) |  | Härtbarkeit (min. Anforderungen)<br>Hardenability (min. requirements)<br>Trempeabilité (exigence min.)<br>(ASTM-A 255) |                         | Magnetpulverprüfung<br>Magnetic particle inspection<br>Essai à la poudre magnétique<br>(AMS 2301 K/ASTM-1444) |             | Makroätzung<br>Macrostructure test<br>Essai de macrostructure<br>(ASTM-E 381) |          |          |
|---|---------------------------|--|--|--|-------------------------|---|-------------|---|----------|----------|
|   |                           | min. 5   |  | J(5/16")<br>min. 35 HRC  | J(8/16")<br>min. 28 HRC | F max. 0,34   | S max. 0,25 | max. S 2  | max. R 1 | max. C 2 |
| 253636                                  | 008                       | 9  |  | 44   | 34                      | 0,020   | 0,015       | S 2   | R 1      | C 2      |
| Decarburization<br>Depth                |                           | Outside 0,000 mm   |  | Inside 0,050 mm  |                         |   |             |   |          |          |



Der Stahl ist frei von Quecksilberverunreinigungen. / The steel is free of mercury contamination. / L'acier est libre des contaminations de mercure.

Paderborn Schloß Neuhaus, 07.03.2017  
Tel.: (0)5254.81-201760 Fax: (0)5254.81-201752

Abnahmebeauftragter  
Inspection representative  
Contrôleur

Thomas Gollan

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# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M4130u/0.500w.083 DATE: DEC 19 2017

MATERIAL CERT REC'D: Yes  
 QUANTITY RECEIVED: 60"  
 QUANTITY INSPECTED: 60"  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .083w  
 THICKNESS RECEIVED: .083w  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

PO / BATCH NO.: 038640/5084902

| DESCRIPTION                     | NCR (Check Y/N)                     | COMMENTS |
|---------------------------------|-------------------------------------|----------|
| SURFACE DAMAGE                  | <input checked="" type="checkbox"/> |          |
| CORRECT FINISH                  | <input checked="" type="checkbox"/> |          |
| CORROSION                       | <input checked="" type="checkbox"/> |          |
| CORRECT GRAIN DIRECTION         | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL PER M-DRAWING  | <input checked="" type="checkbox"/> |          |
| CORRECT THICKNESS               | <input checked="" type="checkbox"/> |          |
| PHOTO REQUIRED                  | <input checked="" type="checkbox"/> |          |
| CORRECT REF # TO LINK CERT      | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL IDENTIFICATION | <input checked="" type="checkbox"/> |          |
| CORRECT M# ON THE MATERIAL      | <input checked="" type="checkbox"/> |          |
| DOES THIS MATERIAL REQUIRE      | <input checked="" type="checkbox"/> |          |
| ENGINEERING SIGN OFF            | <input checked="" type="checkbox"/> |          |
| DOES THIS REQUIRE AN            | <input checked="" type="checkbox"/> |          |
| EXTRUSION REPORT                | <input checked="" type="checkbox"/> |          |

| CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. |                     |                              |                                       |         |
|--|---------------------|------------------------------|---------------------------------------|---------|
| TYPE OF MATERIAL   | SIZE OF TEST SAMPLE | HARDNESS / DUROMETER READING | Testers located in the Quality Office |         |
| HRC  | HRB                 | DUR A                        | DUR D                                 | WEBSTER |
|  |                     |                              |                                       |         |
|  |                     |                              |                                       |         |
|  |                     |                              |                                       |         |
|  |                     |                              |                                       |         |

**QC 18 INSPECTION**

ENGINEERING SIGNOFF (if required)

SIGNED OFF BY: [Signature] DATE: DEC 19 2017

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

# SPECIFICATION CONTROL DRAWING

PURCHASE MATERIAL: AISI 4130N SEAMLESS STEEL TUBING  
 SPECIFICATION: MIL-T-6736 OR AMS 6374 6360 6361, 6362, 6373, 6374  
 PART NUMBER: M4130N TO DDD W/ TTT WHERE: "D DDD" = OUTER DIAMETER (IN INCHES)  
 AND "TTT" = WALL THICKNESS (IN INCHES)  
 DIA. WALL

EG. 3/4" TUBING WITH .035" WALL = M4130NT0.750W.035

RELEASE  
 2012-04-16

|            |             |   |   |    |          |
|------------|-------------|---|---|----|----------|
| B          |             | REFORMAT DWG TO ACCOMMODATE ADDITIONAL TUBE<br>DIAMETERS AND WALL THICKNESS |   | RP | 12.04.02 |
| A          |             | NEW ISSUE   |   | JB | 01.05.16 |
| REV        | DESCRIPTION | DATE  |   |    |          |
| DESIGN     | JB          | RP  | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA   |    |          |
| DRAWN      | RP          | AP  | DRAWING NO.<br>M4130N-T   |    |          |
| CHECKED    | AP          | AP  | REV. B  |    |          |
| MFG. APPR. | AP          | AP  | SHEET 1 OF 1  |    |          |
| APPROVED   | AP          | AP  | TITLE<br>STEEL TUBING   |    |          |
| DE APPR.   | AP          | AP  | SCALE<br>NTS  |    |          |
| DATE       | 12.04.02    |   | COPYRIGHT © 2001 BY DART AEROSPACE LTD<br>THIS DRAWING IS THE PROPERTY OF DART AEROSPACE LTD<br>NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS<br>WITHOUT EXPRESS WRITTEN PERMISSION FROM DART AEROSPACE LTD |    |          |

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: Mobility to 500w.049 DATE: DEC 19 2017  
 PO / BATCH NO.: 038640/5024961

MATERIAL CERT REC'D: Yes QUANTITY RECEIVED: 48"  
 QUANTITY INSPECTED: 48" QUANTITY REJECTED: 0  
 THICKNESS ORDERED: 0.049w THICKNESS RECEIVED: 0.049w  
 SHEET SIZE ORDERED: N/A SHEET SIZE RECEIVED: N/A

| DESCRIPTION                     | NCR (Check Y/N)                     | COMMENTS |
|---------------------------------|-------------------------------------|----------|
| SURFACE DAMAGE                  | <input checked="" type="checkbox"/> |          |
| CORRECT FINISH                  | <input checked="" type="checkbox"/> |          |
| CORROSION                       | <input checked="" type="checkbox"/> |          |
| CORRECT GRAIN DIRECTION         | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL PER M-DRAWING  | <input checked="" type="checkbox"/> |          |
| CORRECT THICKNESS               | <input checked="" type="checkbox"/> |          |
| PHOTO REQUIRED                  | <input checked="" type="checkbox"/> |          |
| CORRECT REF # TO LINK CERT      | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL IDENTIFICATION | <input checked="" type="checkbox"/> |          |
| CORRECT M# ON THE MATERIAL      | <input checked="" type="checkbox"/> |          |
| DOES THIS MATERIAL REQUIRE      | <input checked="" type="checkbox"/> |          |
| ENGINEERING SIGN OFF            | <input checked="" type="checkbox"/> |          |
| DOES THIS REQUIRE AN            | <input checked="" type="checkbox"/> |          |
| EXTRUSION REPORT                | <input checked="" type="checkbox"/> |          |

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK.  
 RECORD RESULTS BELOW

| TYPE OF MATERIAL | SIZE OF TEST SAMPLE | HARDNESS / DUROMETER READING |
|------------------|---------------------|------------------------------|
| HRC              | HRB                 | DUR A                        |
| DUR D            | WEBSTER             |                              |

Testers located in the Quality Office

QC 18 INSPECTION

ENGINEERING SIGNOFF (if required)

INSPECTED BY: [Signature]

SIGNED OFF BY:

DATE: DEC 19 2017

DATE:

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

FORMS\Quality Assurance\approved QAMRIF Material Receipt Inspection Form revD

PURCHASE MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING

SPECIFICATION:

WWT-700/8  
OR QQ-A-200/8 OR QQ-A-225/8  
OR AMS 4080 OR AMS 4082 OR AMS 4083  
OR ASTM B210 OR ASTM B241

PART NUMBER:

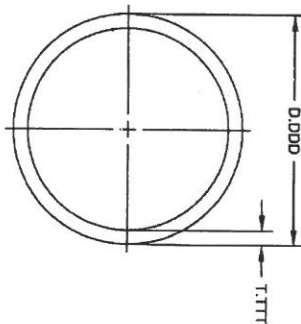
M6061T6TDDDDWTTT

WHERE "T.D.D.D." = OD IN INCHES  
"T.T.T.T." = WALL THICKNESS

EG. 3/8" OD X 0.058 WALL = M6061T6T0.375W0.058

MATERIAL TOLERANCE:

PER ANSI H35.2



|            |          |                             |              |
|------------|----------|-----------------------------|--------------|
| DESIGN     | A/S      | DESCRIPTION                 | DATE         |
| DRAWN      | A/S      | DART AEROSPACE LTD          |              |
| CHECKED    | W        | HAMKESBURY, ONTARIO, CANADA |              |
| MFG. APPR. | W        | DRAWING NO.                 | REV. C       |
| APPROVED   | W        | M6061T6T                    | SHEET 1 OF 1 |
| DATE       | 13.06.12 | TITLE                       | SCALE        |
|            |          | 6061-T6 TUBING              | NTS          |

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RELEASED  
2013-07-02  
MP



# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M6061H670.375W.058

PO / BATCH NO.: 038640/5024960

DATE: DEC 19

MATERIAL CERT REC'D: YES

QUANTITY RECEIVED: 228"

QUANTITY INSPECTED: 240"

QUANTITY REJECTED: 12"

THICKNESS ORDERED: 0.375 W

THICKNESS RECEIVED: 0.38 W

SHEET SIZE ORDERED: N/A

SHEET SIZE RECEIVED: N/A

THICKNESS ORDERED: 0.375 W  
THICKNESS RECEIVED: 0.38 W  
SHEET SIZE ORDERED: N/A  
SHEET SIZE RECEIVED: N/A

| DESCRIPTION                     | NCR (Check Y/N) | COMMENTS |
|---------------------------------|-----------------|----------|
| SURFACE DAMAGE                  | Y               |          |
| CORRECT FINISH                  | Y               |          |
| CORROSION                       | Y               |          |
| CORRECT GRAIN DIRECTION         | Y               |          |
| CORRECT MATERIAL PER M-DRAWING  | Y               |          |
| CORRECT THICKNESS               | Y               |          |
| PHOTO REQUIRED                  | Y               |          |
| CORRECT REF # TO LINK CERT      | Y               |          |
| CORRECT MATERIAL IDENTIFICATION | Y               |          |
| CORRECT M# ON THE MATERIAL      | Y               |          |
| DOES THIS MATERIAL REQUIRE      | Y               |          |
| ENGINEERING SIGN OFF            | Y               |          |
| DOES THIS REQUIRE AN            | Y               |          |
| EXTRUSION REPORT                | Y               |          |

CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK.  
RECORD RESULTS BELOW

| TYPE OF MATERIAL | SIZE OF TEST SAMPLE | HARDNESS / DUROMETER READING |
|------------------|---------------------|------------------------------|
| HRC              | HRB                 | DUR A                        |
| DUR D            | WEBSTER             |                              |

Testers located in the Quality Office

QC 18 INSPECTION

ENGINEERING SIGNOFF (if required)

INSPECTED BY: [Signature]

SIGNED OFF BY:

DATE: DEC 19 2017

DATE:

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

FORMS\Quality Assurance\approved QAMRIF Material Receipt Inspection Form revD

PURCHASE MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING

SPECIFICATION:

WW-T-700/8  
OR QQ-A-200/8 OR QQ-A-225/8  
OR AMS 4080 OR AMS 4082 DR AMS 4083  
OR ASTM B210 OR ASTM B241

PART NUMBER:

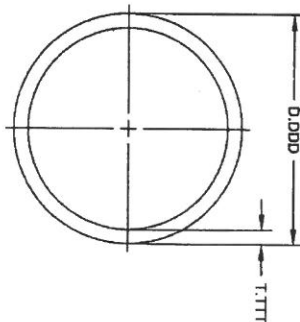
M6061T6T D.DDDW/T.TTT  
OD | WALL

WHERE "D.DDD" = OD IN INCHES  
"T.TTT" = WALL THICKNESS

EG. 3/8" OD X 0.058 WALL = M6061T6T0.375W0.058

MATERIAL TOLERANCE:

PER ANSI H35.2



RELEASED  
2013-07-02

|   |                |  |          |
|---|----------------|--|----------|
| COMPLETE REFORMAT, ADDED T6510 & T6511. |                | AMS  | 13.06.12 |
| ADDED AMS 4083, ASTM B210 & ASTM B241   |                | CP   | 04.01.23 |
| ADDED MATERIAL TOLERANCE                |                | DS   | 01.08.21 |
| NEW ISSUE                               |                | BY   | DATE     |
| DESIGN                                  | AMS            | <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA |          |
| DRAWN                                   | AMS            |  |          |
| CHECKED                                 | AMS            |  |          |
| MFG. APPR.                              | M6061T6T       |  |          |
| APPROVED                                | 13.06.12       |  |          |
| DE APPR.                                | 6061-T6 TUBING | REV. C   |          |
| DATE                                    | 13.06.12       | SHEET 1 OF 1   |          |
|   |                | SCALE  |          |
|   |                | NTS  |          |

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# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: m60616 to 3125w058 DATE: DEC 19 2017  
 PO / BATCH NO.: 038640/5025047

MATERIAL CERT REC'D: Yes  
 QUANTITY RECEIVED: 240"  
 QUANTITY INSPECTED: 240"  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .058 w  
 THICKNESS RECEIVED: .058 w  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

| DESCRIPTION                                     | NCR (Check Y/N)                     | COMMENTS |
|---|-------------------------------------|----------|
| SURFACE DAMAGE                                  | <input checked="" type="checkbox"/> |          |
| CORRECT FINISH                                  | <input checked="" type="checkbox"/> |          |
| CORROSION                                       | <input checked="" type="checkbox"/> |          |
| CORRECT GRAIN DIRECTION                         | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL PER M-DRAWING                  | <input checked="" type="checkbox"/> |          |
| CORRECT THICKNESS                               | <input checked="" type="checkbox"/> |          |
| PHOTO REQUIRED                                  | <input checked="" type="checkbox"/> |          |
| CORRECT REF # TO LINK CERT                      | <input checked="" type="checkbox"/> |          |
| CORRECT MATERIAL IDENTIFICATION                 | <input checked="" type="checkbox"/> |          |
| CORRECT M# ON THE MATERIAL                      | <input checked="" type="checkbox"/> |          |
| DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF | <input checked="" type="checkbox"/> |          |
| DOES THIS REQUIRE AN EXTRUSION REPORT           | <input checked="" type="checkbox"/> |          |

AMS 4082  
Heat # 2806820

|  |     |       |       |         |
|--|-----|-------|-------|---------|
| CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. |     |       |       |         |
| RECORD RESULTS BELOW                                       |     |       |       |         |
| HRC  | HRB | DUR A | DUR D | WEBSTER |
| TYPE OF MATERIAL   |     |       |       |         |
| SIZE OF TEST SAMPLE  |     |       |       |         |
| HARDNESS / DUROMETER READING                               |     |       |       |         |
|  |     |       |       |         |
|  |     |       |       |         |
|  |     |       |       |         |

**QC 18 INSPECTION** ENGINEERING SIGNOFF (if required)

INSPECTED BY: [Signature] DATE: DEC 19 2017  
 SIGNED OFF BY: \_\_\_\_\_ DATE: \_\_\_\_\_

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

PURCHASE MATERIAL: 6061-T6/T62/T6510/T6511 SEAMLESS TUBING

SPECIFICATION:

WM-T-7008  
OR QQ-A-200/8 OR QQ-A-225/8  
OR AMS 4080 OR AMS 4082 OR AMS 4083  
OR ASTM B210 OR ASTM B241

PART NUMBER:

M6061T6T D.DDDW/T.TTT

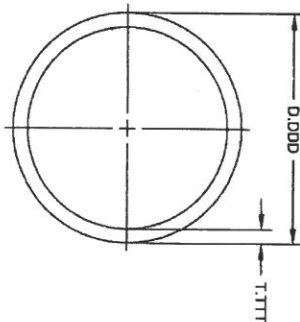
WHERE "D.DDD" = OD IN INCHES

"T.TTT" = WALL THICKNESS

EG. 3/8" OD X 0.058 WALL = M6061T6T0.375W0.058

MATERIAL TOLERANCE:

PER ANSI H35.2



RELEASED  
2013-07-02

|            |  |     |          |
|------------|--|-----|----------|
| C          | COMPLETE PERFORMANCE, ADDED T6510 & T6511, ADDED AMS 4083, ASTM B210 & ASTM B241 | AMS | 13.06.12 |
| B          | ADDED MATERIAL TOLERANCE   | CP  | 04.01.23 |
| A          | NEW ISSUE  | DS  | 01.06.21 |
| REV.       | DESCRIPTION  | BY  | DATE     |
| DESIGN     | AMS  |     |          |
| DRAWN      | AMS  |     |          |
| CHECKED    | AMS  |     |          |
| MFG. APPR. | M6061T6T   |     |          |
| APPROVED   |  |     |          |
| DE APPR.   | 6061-T6 TUBING   |     |          |
| DATE       | 13.06.12   |     |          |

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DART AEROSPACE LTD  
HAWKESBURY, ONTARIO, CANADA

DRAWING NO.

M6061T6T

TITLE

6061-T6 TUBING

REV. C  
SHEET 1 OF 1  
SCALE  
NTS

# MATERIAL RECEIPT INSPECTION FORM

MATERIAL: M606 H6 to 3.75 W0.35

DATE: DEC 19 2017

PO / BATCH NO.: 038640/5024959

MATERIAL CERT REC'D: Yes  
 QUANTITY RECEIVED: 48"  
 QUANTITY INSPECTED: 48"  
 QUANTITY REJECTED: 0

THICKNESS ORDERED: .035  
 THICKNESS RECEIVED: .035  
 SHEET SIZE ORDERED: N/A  
 SHEET SIZE RECEIVED: N/A

| DESCRIPTION                                     | NCR (Check Y/N)                       | COMMENTS |
|---|---------------------------------------|----------|
| SURFACE DAMAGE                                  | <input checked="" type="checkbox"/> Y |          |
| CORRECT FINISH                                  | <input checked="" type="checkbox"/> Y |          |
| CORROSION                                       | <input checked="" type="checkbox"/> Y |          |
| CORRECT GRAIN DIRECTION                         | <input checked="" type="checkbox"/> Y |          |
| CORRECT MATERIAL PER M-DRAWING                  | <input checked="" type="checkbox"/> Y |          |
| CORRECT THICKNESS                               | <input checked="" type="checkbox"/> Y |          |
| PHOTO REQUIRED                                  | <input checked="" type="checkbox"/> Y |          |
| CORRECT REF # TO LINK CERT                      | <input checked="" type="checkbox"/> Y |          |
| CORRECT MATERIAL IDENTIFICATION                 | <input checked="" type="checkbox"/> Y |          |
| CORRECT M# ON THE MATERIAL                      | <input checked="" type="checkbox"/> Y |          |
| DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF | <input checked="" type="checkbox"/> Y |          |
| DOES THIS REQUIRE AN EXTRUSION REPORT           | <input checked="" type="checkbox"/> Y |          |

|  |     |       |       |         |
|--|-----|-------|-------|---------|
| CUT SAMPLE PIECE OF MATERIAL AND PERFORM A HARDNESS CHECK. |     |       |       |         |
| RECORD RESULTS BELOW                                       |     |       |       |         |
| HRC  | HRB | DUR A | DUR D | WEBSTER |
|  |     |       |       |         |
|  |     |       |       |         |
|  |     |       |       |         |
| TYPE OF MATERIAL   |     |       |       |         |
| SIZE OF TEST SAMPLE  |     |       |       |         |
| HARDNESS / DUROMETER READING                               |     |       |       |         |

Testers located in the Quality Office

**QC 18 INSPECTION**

ENGINEERING SIGNOFF (if required)

SIGNED OFF BY: \_\_\_\_\_

DATE: DEC 19 2017

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

PURCHASE MATERIAL: 6081-T6/T82/T6510/T6511 SEAMLESS TUBING

SPECIFICATION:

WW-T-7006  
OR QQ-A-200/8 OR QQ-A-225/8  
OR AMS 4080 OR AMS 4082 DR AMS 4083  
OR ASTM B210 OR ASTM B241

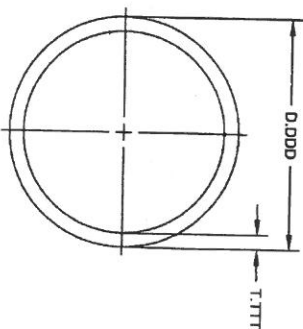
PART NUMBER:

M6081T6T/P.D.DD/W.T.TTT  
OD WALL

WHERE "D.DD" = OD IN INCHES  
"T.TT" = WALL THICKNESS

MATERIAL TOLERANCE:

EG. 3/8" OD X 0.056 WALL = M6081T6T0.375W0.056  
PER ANSI H35.2



|   |   |     |          |
|---|---|-----|----------|
| C   | COMPLETE REFORMAT, ADDED T6510 & T6511. | AMS | 13.06.12 |
| B   | ADDED AMS 4083, ASTM B210 & ASTM B241   | CP  | 04.07.23 |
| A   | ADD QQ-A-200/8 & QQ-A-225/8             | DS  | 01.06.21 |
| REV.  | NEW ISSUE                               | BY  | DATE     |
| DESIGN  | AMS                                     |     |          |
| DRAWN   | AJS                                     |     |          |
| CHECKED   | W                                       |     |          |
| MFG. APPR.  | M6081T6T                                |     |          |
| APPROVED  |   |     |          |
| DE APPR.  |   |     |          |
| DATE  | 13.06.12                                |     |          |
| DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA |   |     |          |
| DRAWING NO. M6081T6T                              |   |     |          |
| TITLE 6081-T6 TUBING                              |   |     |          |
| REV. C  |   |     |          |
| SHEET 1 OF 1                                      |   |     |          |
| SCALE NTS   |   |     |          |

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RELEASED  
2013-07-02  
M6